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THE EFFECTS OF MINDFULNESS TRAINING ON MINDFULNESS, SELF-COMPASSION, LOCUS OF CONTROL, AND SELF-EFFICACY

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Abstract

In this study I examined the effects of mindfulness training on eight variables: self-compassion, self-efficacy, locus of control, and five facets of mindfulness (Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience) in a graduate student sample. Self-report data was collected from an intervention group (n = 23) throughout a 14-week mindfulness training course, and at 3-month follow-up, and compared to data from a control group (n = 21). The results reflected statistically significant increases in the intervention group's reported levels of self-compassion, Observing, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience that were not replicated in the control group. There were no statistically significant differences between groups in the other variables. The results of this study suggest that some facets of mindfulness are increased through mindfulness training. These findings also provide empirical support for the relationship between mindfulness and self-compassion, and suggest the possibility of increased self-compassion as part of the mechanism of change in mindfulness-based interventions.

Keywords: mindfulness; self-compassion; self-efficacy; locus of control

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Introduction

In this study I examined the effects of mindfulness training on eight constructs: self-compassion, locus of control, general self-efficacy, and five facets of mindfulness (Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience). The construct of mindfulness has received considerable attention in the psychological community over the past thirty years. Mindfulness involves maintaining one's attention to the present moment in a nonjudgmental manner, and is a central component of some eastern spiritual traditions, particularly Buddhism. Mindfulness is traditionally cultivated through a regular mindfulness-meditation practice (Bishop et al., 2004).

A number of researchers have attempted to define and quantify the construct of mindfulness. Similarities and differences have emerged in these attempts. Mindfulness can be conceptualized as a mode or state (Bishop et al., 2004), a trait (Brown & Ryan, 2004), or a set of skills (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Some researchers view mindfulness as a unidimensional construct (Brown & Ryan), whereas others view it as consisting of multiple facets (Baer et al.). Bishop et al. outlined a two-component model of mindfulness consisting of the self-regulation of attention towards one's immediate experience and a curious, open, accepting orientation towards one's present moment. Baer et al. identified five factors of mindfulness: Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience. Although definitions and quantifications of mindfulness may differ, the benefits of this construct have been well documented in a number of empirical studies. Mindfulness is positively correlated with positive psychological functioning, and is now

a fundamental component of a number of psychological interventions (Baer, 2003; Dalrymple & Herbert, 2007; Kabat-Zinn, 1982, 1990; Linehan, 1993a, 1993b).

Another fundamental component of Buddhist tradition, but one that has received far less attention from the psychological community, is self-compassion. Neff (2003) conceptualizes self-compassion as (a) the act of extending kindness and understanding, as opposed to judgment and criticism, to oneself in times of suffering; (b) perceiving one's situation within the context of the larger human experience; and (c) being mindful of, but not over-identifying with, one's uncomfortable thoughts and feelings. Self-compassion, as operationalized by Neff, is measured by the Self-Compassion Scale (SCS; 2003). Studies using the SCS have illustrated a positive correlation between self-compassion and mental health (Neff, 2004; Neff, Kirkpatrick, & Rude, 2007; Neff, Rude, & Kirkpatrick, 2007).

Locus of control refers to the extent to which a person perceives occurrences in one's life to be within his or her own control. It is characterized as being either internal or external. A person with an internal locus of control believes that reinforcement is based upon his or her own actions. In contrast, a person with an external locus of control believes that reinforcement is based upon outside influences such as chance, luck, or other, more powerful people.

Self-efficacy refers to the extent to which a person believes that he or she is capable of accomplishing a given task. As Bandura (1997) explains, a person's self-efficacy will likely differ in various areas of their lives. However, for the purpose of this study, I examined general self-efficacy.

Given that mindfulness interventions are often used to treat mental disorders, it is important to determine if mindfulness interventions do in-fact increase mindfulness in patients. It will also be helpful to know whether other constructs are being affected by mindfulness

training. An increase in mindfulness is the assumed mechanism of change in mindfulness-based interventions, but other theoretically and empirically related constructs, such as self-compassion, self-efficacy, and locus of control, could also play a role. This study will help to clarify whether and to what extent these constructs are affected by mindfulness training.

The constructs of locus of control and self-efficacy have been extensively researched for decades, thus my review of the literature in these areas will be brief. By contrast, self-compassion and mindfulness are newer concepts in the field of clinical psychology. Therefore, my review of the literature in these areas, as well as the theoretical relationship between the two, will be more extensively discussed.

Mindfulness

Meditation

As previously stated, mindfulness is a construct that involves maintaining one's attention to the present moment in a nonjudgmental manner, and it is commonly cultivated through a regular meditation practice (Bishop et al., 2004). Mindfulness meditation typically involves a participant sitting, either on the floor or in a chair. The person tries to maintain attention on a particular "anchor," often the sensations of his or her own breath. Inevitably, thoughts and feelings arise, which distract the person from the present reality. When the person notices that his or her attention has strayed, the person redirects his or her attention back to the breath. (Eventually, as the meditator gains experience, the focus shifts from focus on an anchor to a more open attention and to contemplation of specific phenomena.) This process is repeated throughout the duration of the meditation. The person attempts to notice any thoughts and feelings that arise, without judging, elaborating, or acting on these thoughts and feelings (Kabat-Zinn, 1990; Segal, Williams, & Teasdale, 2002). From a westernized, psychological perspective,

the person performs this task with the purpose of cultivating a more mindful state that can be beneficial outside of meditation. In Buddhist tradition, the purpose of meditation is to develop wisdom, particularly with regard to enlightenment and the cessation of suffering.

Although meditation is typically considered the primary method through which mindfulness is cultivated, it must be noted that mindfulness is a naturally occurring phenomena. Research has indicated that there is significant variance within the general population (most of whom lack formal meditation training or experience) with regard to mindfulness as it is assessed by current measures (Brown & Ryan, 2003; Carlson & Brown, 2003; Levesque & Brown, 2003). Scores on some mindfulness measures have indicated significant, positive correlations with meditation experience, whereas others have not (Baer et al., 2006).

Proposed Definitions

Although mindfulness is often referred to in psychological literature, there is no one, agreed-upon definition. Thus, in order to gain a better understanding of the construct, I will examine some of the different proposed definitions. As previously noted, Bishop et al. (2004) proposed a two-component definition of mindfulness. The first component is self-regulation of attention. This component involves a number of qualities: sustained attention, the ability to maintain attention on an object for a prolonged period; switching, a flexibility of mind which allows a person to direct one's focus from one object to another; and an awareness and observation of, as opposed to rumination about, the direct experiences of the mind and body. The second component in this model is orientation to experience, which involves a commitment to be curious about the activity of one's mind and an acceptance of one's moment-by-moment experience. It should be noted that this two-component definition represents the consensus of a number of leading researchers in the area of mindfulness. However, many critical commentaries

were published in response to the Bishop et al. definition, including a response by Brown and Ryan (2004) discussed below.

Brown and Ryan (2004) differentiate between attention and awareness, with awareness referring to one's subjective experience of internal and external stimuli. Attention, by contrast, refers to the focusing of one's awareness. Brown and Ryan also discuss a contradiction within Bishop et al's (2004) definition: How can mindfulness involve deliberate attention on a particular focus (such as one's breath), and at the same time involve a nonjudgmental acceptance of and curiosity towards whatever the mind does? They address this contradiction by differentiating between two different types of meditation: concentration meditation, which involves focused attention on an internal or external object; and awareness/insight attention, which involves awareness of internal and external present experience. Brown and Ryan also suggest that the second component of the Bishop et al. model, acceptance, is redundant, stating that implicit within the act of maintaining attention and awareness towards one's present experience is the ability to be accepting of that experience. They explain that without acceptance of the experience, the person is likely to limit his or her awareness and redirect his or her attention from the experience. Brown and Ryan also de-emphasize meditation, explaining that mindfulness benefits may be particularly relevant outside of meditative practice.

As illustrated from the two different understandings of mindfulness summarized above, there are some fundamental differences in how mindfulness is conceptualized. These differences can create difficulties in quantifying mindfulness. Other problems in quantifying the construct include differing semantic understanding of self-report scale items and inaccurate self-ratings (Grossman, 2008). Despite these difficulties, a number of researchers have attempted to quantify

mindfulness by constructing self-report scales. These scales, as well as their similarities and differences, are discussed below.

Measures of Mindfulness

The Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001) is a unidimensional 30-item self-report measure developed using a sample of individuals attending intensive meditation retreats. Items are scored using a 4-point Likert scale. It is primarily designed for use with experienced meditators. Buchheld, Grossman, and Walach questioned whether mindfulness as measured by their study is more state-like or trait-like, illustrating the difficulty in distinguishing one from the other. The authors reported internal consistencies of .93 and .94 for measurements taken before and after the meditation retreats. A 14-item short form was later designed, which can be used with subjects lacking meditation experience (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006).

The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) is a four-factor, 39-item self-report measure scored using a 5-point Likert scale. The four factors are Observing, Describing, Acting with Awareness, and accepting without judgment. No total mindfulness score is provided. The KIMS is based primarily upon the dialectical behavior therapy (DBT; Linehan, 1993a) concept of mindfulness. That is, it measures mindfulness as a set of skills, and focuses more on behavior as opposed to internal experience. The authors reported internal consistencies of the four factors from .76 to .91.

The trait Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is a unidimensional, 15-item self-report measure scored using a 6-point Likert scale. It measures day-to-day awareness and attentiveness by assessing the extent to which the subject lacks mindfulness (i.e., all of the items inquire as to one's lack of awareness). Mindfulness as

measured by the MAAS is seen as a trait. The authors reported internal consistencies of .86 and .87 for the MAAS using two samples.

The Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) is a five-factor, 39-item self-report measure scored using a 5-point Likert scale. Four of the factors are the same as the factors of the KIMS. The fifth factor is a non-reactive attitude towards internal experience. Like the KIMS, it measures a person's tendency to be mindful in daily life, and does not require meditation experience. Mindfulness within the context of this measure is seen as a state and a set of skills. Baer et al. reported internal consistency for the five facets ranging from .72 to .92. More detail on the FFMQ is provided in the Method section of this study.

Related Constructs and Mindfulness Interventions

Scores on mindfulness measures have been found to be significantly and positively correlated with emotional intelligence, openness to experience, and self-compassion (Baer et al., 2006). Results of the same study indicated significant, negative correlations with psychological symptoms, neuroticism, thought suppression, difficulties in emotion regulation, alexithymia, dissociation, experimental avoidance, and absent-mindedness.

Having gained a level of acceptance in the field of psychology, mindfulness is now a fundamental component of a number of evidence-based psychological interventions. In acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999), mindfulness and acceptance strategies are taught with the aims of increasing psychological flexibility and positive, value-based behavior. Studies have yielded positive results for ACT in the treatment of obsessive-compulsive disorder (Twohig, Hayes, & Masuda, 2006), social anxiety disorder (Dalrymple & Herbert, 2007), depression and anxiety symptoms (Forman, Herbert, Moitra,

Yeomans, & Geller, 2007), chronic pain (Wicksell, Melin, & Olsson, 2007), and a number of other psychological issues.

Dialectical behavior therapy (DBT; Linehan, 1993a, 1993b) is a group and individual skills-based intervention with a heavy mindfulness component. DBT has been successfully used primarily in the treatment of borderline personality disorder (McMain et al., 2009). Other mindfulness interventions include mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982, 1990), which has been shown to decrease stress, anxiety, and depressive symptoms (Segal, Williams, & Teasdale, 2002), and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002), which is used primarily in the treatment of depression. Mindfulness practices are also used in relapse prevention for substance abuse (Marlatt & Gordan, 1985; Parks, Anderson, & Marlatt, 2001).

Self-Compassion

Like mindfulness, self-compassion is also a fundamental component of Buddhist philosophy. However, compared to mindfulness, self-compassion has received far less attention from the psychological community. Neff (2003) explains that compassion is allowing oneself to be touched by the pain of another, while taking an open-minded, nonjudgmental attitude. Through this act, Neff explains, the person recognizes his or her shared humanity with the object of compassion. Self-compassion, Neff explains, consists of applying these concepts to ourselves.

Neff (2004) conceptualizes three main components of self-compassion. The first is extending kindness and understanding to the self when faced with pain or failure. This is in contrast with harsh judgment and criticism that a person might extend to oneself in times of adversity. The second component involves understanding one's experience in context: seeing the experience as part of the overall human experience. Thus, the experience connects the

person to the human race, instead of separating and isolating the person from it. The third component involves mindfulness. More specifically, it involves being mindfully aware of painful thoughts and feelings, as opposed to over-identifying with them.

Contrasting Constructs

Neff (2003) discriminates self-compassion from other, seemingly related constructs. For example, she explains the difference between self-compassion and self-indulgence. Self-compassion, as Neff explains, provides the emotional safety necessary to see oneself clearly and identify areas needing improvement. By contrast, self-indulgence involves letting oneself get away with anything, and not seeing oneself honestly. Neff also discusses self-pity, which involves rumination in one's own problems, and promotes separateness from others, as opposed to connectedness.

Neff (2003) also differentiates self-compassion from self-esteem. Self-compassion involves people caring for themselves because they belong to the human race, whereas self-esteem generally refers to one's sense of self-worth, and is often related to how one compares to and is different from others. Sources of self-compassion are generally static (one will always be a part of humanity), whereas sources of self-esteem are less stable (one cannot always win at everything). Not surprisingly, interventions designed to increase self-esteem are rarely effective (Swaan, 1996). High self-esteem may also have negative consequences, such as narcissism, self-absorption, self-centeredness, and lack of empathy (Baumeister, Bushman, & Campbell, 2000).

Self-Compassion Scale (SCS)

The three components of self-compassion as defined by Neff (2003) are addressed by the six subscales of the SCS. Self-kindness is measured by the self-kindness and self-judgment subscales; the contextual component is measured by the common humanity and isolation

subscales; and the mindfulness component is measured by the mindfulness and over-identification subscales. Three of these subscales (self-kindness, common humanity, and mindfulness) appear to be opposites of the other three (self-judgment, isolation, and over-identification). However, it should be noted that an overall model confirmatory factor analysis supported six separate but correlated factors. As Neff explained, self-kindness and self-judgment are not mutually exclusive; nor are common humanity and isolation, or mindfulness and over-identification. The mere fact that a person does not judge himself does not mean that he will be kind to himself. Similarly, a person may not isolate himself in times of pain, but may also neglect to view the painful experience within the context of common humanity. An absence of over-identification with negative thoughts and emotions does not automatically translate into mindful awareness. Neff also conducted a higher-order confirmatory factor analysis, which supported a single overarching factor of self-compassion.

Empirical Support for Self-Compassion

Studies using the SCS have illustrated a positive correlation between self-compassion and mental health (Neff, 2004). In a correlational study, Neff, Rude, & Kirkpatrick (2007) found self-compassion to be related to happiness, optimism, curiosity, positive affect, and exploration. They also found that self-compassion can act as a buffer against anxiety during times of negative self-evaluation. Furthermore, the results of their study indicated that participants who experienced an increase in self-compassion (through use of the Gestalt two-chair method) experienced an increase in social connectedness. The participants also experienced a decrease in self-criticism, depression, rumination, thought suppression, and anxiety. In a study examining motivation and procrastination in college undergraduates, Williams, Stark, and Foster (2008)

found that students with higher levels of self-compassion reported lower levels of anxiety and less of a tendency to procrastinate.

Avoidance appears to be negatively correlated with self-compassion. Neff, Hseih, and Dejitthirat, (2005) found that students with higher levels of self-compassion were less likely to use avoidance as a coping strategy when faced with academic failure. In a study of university students with posttraumatic stress symptoms, Thompson and Waltz (2008) found that subjects with greater self-compassion had fewer avoidance symptoms of posttraumatic stress. Thus, the current body of research suggests that self-compassion is positively correlated with positive emotions and healthy psychological functioning, and negatively correlated with many negative emotions.

Self-Efficacy

The term *efficacy* refers to the ability to produce a desired result. The terms *Self-efficacy* and *perceived self-efficacy* are often used synonymously. Both refer to a person's belief that he or she is capable of performing successfully in a given area. Self-efficacy is one of the core aspects of Bandura's social-cognitive theory (Bandura, 1977). People with high self-efficacy believe that they are able to produce desired effects, and that they have some level of control over their environment. Thus, self-efficacy, though different, is often seen as being related to locus of control. Self-efficacy and locus of control are two of the four components of the higher order construct of *positive self-concept* (Judge, Locke, & Durham, 1997), and the two constructs are often studied together (Koing, Debus, Hausler, Lendenmann, & Kleinmann, 2010; Iskender & Akin, 2010). Self-efficacy is sometimes perceived as domain specific (e.g., occupational, academic, and health self-efficacy), and sometimes viewed in a more general sense (Sherer et al., 1982; Skinner Chapman, & Baltes, 1988). In this study, I examined general self-efficacy.

Studies have indicated that high self-efficacy is related to a number of positive physical, social, and psychological outcomes. In a study of 174 patients undergoing heart surgery, Schroder, Schwarzer, and Konertz (1988) found that higher levels of general self-efficacy were related to better recovery a week after surgery and better quality of life a year and a half after surgery. Schwarzer, Hahn, and Jerusalem (1993) found that East German refugees with higher general self-efficacy were healthier, more integrated socially, and more likely to be employed two years after being relocated than those with low self-efficacy. In a seven-year longitudinal study of 390 adolescents, Caprara, Gerbino, Paciello, Di Giunta, and Pastorelli (2010) found that emotional self-efficacy (the perceived ability to handle negative emotions and express positive emotions) was directly and significantly related to lower levels of depression and delinquency. In a study of 113 college students and individuals with social phobia, Thomasson and Psouni (2010) found that the severity of social anxiety and its related social impairment were greater in participants with low self-efficacy.

Locus of Control

The concept of locus of control originated as a central component of Rotter's social learning theory of personality (Rotter, 1954). Locus of control addresses the extent to which a person believes that reinforcement is dependent upon his or her own behavior or personal qualities. People with high-perceived internal locus of control believe that they will receive reinforcement based upon their own actions. By contrast, people with high external locus of control believe that regardless of their own actions, their fate rests in the hands of luck, fate, or other, more powerful entities (Rotter, 1966). The construct of locus of control is often viewed in relation to specific domains. A person may perceive high internal locus of control in one area of

life, such as social relationships, but high external locus of control in another area, such as career advancement. Within this study however, locus of control was measured as a general trait.

The large body of research into locus of control indicates that internal locus of control is related to positive functioning in a number of areas. Judge and Bono (2001) conducted a meta-analysis of 216 studies and found that internal locus of control was positively correlated with job satisfaction and job performance. In their meta-analysis of 97 studies examining the relationship between depression and locus of control, Benassi, Sweeney, and Dufour (1988) found a medium effect size of .31, indicating that higher levels of depression are related to a more externalized perception of control. In a study of 514 Turkish university students, Arslan, Dilmac, and Hamarta (2009) found that students with an internal locus of control had significantly lower trait anxiety scores than those with an external locus of control. The researchers also found that participants with an internal locus of control were more likely to use problem-focused coping skills, in which the person attempts to change his or her relationship with the environment in order to feel better. These results support the logical assumption that people who believe that they have the ability to change negative situations are more likely to try to do so.

Relationships Among Constructs

The constructs of mindfulness and self-compassion are theoretically related, as mindfulness is one of the subscales of the SCS. There is also empirical support for this relationship. Baer et al. (2006) found positive correlations between the SCS and five different mindfulness questionnaires. The researchers found all five of the FFMQ facets (Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and non-reactivity towards inner experience) to be significantly correlated with the SCS.

In a study with 390 participants from a university in Turkey, Iskender (2009) found that self-compassion (as measured by the SCS) had small, insignificant correlations with self-efficacy and locus of control as measured by subscales of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich, Smith, Garcia, & McKeachie, 1993). In this study, locus of control and self-efficacy were measured not as general constructs (as they will be measured in this study), but were viewed as they specifically apply to learning.

Leary, Tate, Adams, Allen, and Hancock (2007) conducted a study designed to induce a self-compassionate state and examine how self-compassion moderates reactions to painful memories. The authors found that participants in an induced self-compassionate state were more likely to accept responsibility for their roles in negative events. This finding supports Neff's (2003) declaration that self-compassion differs from self-pity. It also suggests that there may be a positive correlation between self-compassion and internal locus of control.

Greason and Cashwell (2009) examined the relationship between mindfulness and counseling self-efficacy among a sample (n=179) of counseling interns and students (Master's- and doctoral-level). Their results indicated that mindfulness is significantly, positively correlated with counseling self-efficacy. Further analyses indicated that mindfulness is a predictor of counseling self-efficacy.

Locus of control and self-efficacy are theoretically related, as they are two of the four components of the higher order construct of *positive self-concept* (Judge, Locke, & Durham, 1997). Judge, Erez, Bono, and Thoresen, (2002) conducted a meta-analysis and found high correlations between general self-efficacy and internal locus of control. Furthermore, the researchers constructed a multitrait-multimethod matrix, and found poor discriminant validity between measures of locus of control and general self-efficacy (it should be noted that Judge et

al. used different measures than those that I will use in the proposed study), causing the researchers to ask if the two constructs (along with neuroticism and self-esteem) are indicators of a higher order construct.

In a 2010 study, St. Charles found all of the constructs targeted in this study to be positively correlated with one another in a group of graduate students. Large correlations were found between mindfulness and self-compassion, self-compassion and self-efficacy, and internal locus of control and self-efficacy. Medium-sized correlations were found between internal locus of control and self-compassion, mindfulness and self-efficacy, and mindfulness and internal locus of control.

Effects of Mindfulness Training in Previous Research

Research in the area of mindfulness suggests that the construct is related to meditation training. Chambers, Lo, and Allen (2008) found that a 10-day intensive mindfulness meditation retreat led to significant increases in mindfulness in 20 novice meditators. In an examination of construct validity of the FFMQ (Baer et al., 2008), meditation experience was found to be significantly correlated with four of the mindfulness factors (all except for Acting with Awareness).

A number of researchers have reported positive results in treating psychological problems with mindfulness-based interventions. Tacon, Caldera, and Ronaghan (2004) reported significant decreases in stress and anxiety in a group of 27 women with breast cancer who were treated with the 8-week MBSR protocol. The results also reflected positive changes in mental adjustment to cancer and health locus of control. Carlson et al. (2003) examined the effects of MBSR with 59 cancer patients, and found significant improvements in stress symptoms, sleep, and overall quality of life. Ma and Teasdale (2004) found that MBCT, when added to treatment

as usual, reduced depressive relapse from 78% to 36% in 55 participants with three or more previous depressive relapses. In a 2010 meta-analysis of 39 studies, Hoffman, Sawyer, Witt, and Oh found mindfulness-based therapy to be effective in treating mood and anxiety symptoms, particularly in patients with mood and anxiety disorders.

Other studies have illustrated the effects of mindfulness training on locus of control. Flinton (1997) examined the effects of an eight-week meditation program on incarcerated adolescent boys (n=42). The program included exercises in relaxation, concentration, and mindfulness meditation. The participants in the meditation group reported significant decreases in anxiety and increases in internal locus of control with regard to being in a prison environment. In a 2006 study (Bowen et al.) of mindfulness meditation and substance use in an incarcerated population (n=173), participants of a 10-day mindfulness meditation training program reported a decrease in substance use and substance-related problems, and an increase in alcohol-related internal locus of control.

Several studies similar to this current study have examined the effects of mindfulness training, particularly training based on MBSR, on health professionals and trainees. Shapiro, Schwartz, and Bonner (1998) conducted a study with a sample of premedical and medical students (*n*=78). The researchers found that after seven weeks of mindfulness-based stress reduction training, participants reported decreased levels of anxiety, psychological distress, and depression. They also endorsed increased levels of empathy and an increase in spiritual experiences. Rosenzweig, Reibel, Greeson, Brainard, and Hojat (2003) found that MBSR lowered psychological distress in a sample of second-year medical students (*n*=302) at the same time that psychological distress increased in the control group. Shapiro, Astin, Bishop, and Cordova (2005) examined the effects of an eight-week MBSR training intervention on a sample

(*n*=36) of health care professionals (medical and mental health professionals). The results reflected increases in self-compassion and life satisfaction, as well as decreases in stress, job burnout, and distress. And finally, in a 2007 study, Shapiro, Brown, and Biegel found that participants (*n*=54) from a master's level counseling psychology program who engaged in a Stress and Stress Management Course (a 10-week course which included an 8-week MBSR training component) reported decreases in stress, negative affect, rumination, anxiety, as well as increases in positive affect, self-compassion, and mindfulness.

Although there are a number of studies that indicate positive outcomes for mindfulness-based interventions, many of these studies do not measure changes in mindfulness in their participants, or changes in other constructs, such as those that I targeted in this study (although two of the studies cited above do include measures of mindfulness and self-compassion). Thus, it is often not known if it is an increase in mindfulness, or some other mechanism, that is leading to positive outcomes in these studies.

Mindfulness Training in this Study

Mindfulness training was provided through a doctoral clinical psychology course entitled Mindfulness-Based Interventions. This was a 14-week course that involved daily mindfulness practice, group discussions, and lessons on mindfulness-based psychological interventions and Buddhist psychological principles as they relate to mindfulness practice. The weeks two through nine of the course included participation in the MBCT protocol.

MBCT

MBCT is an 8-week manualized group treatment to prevent depressive relapse that involves weekly group meditations, group exercises, group discussions, and daily meditation homework assignments. It was developed by Segal, Williams, and Teasdale (2002), and

modeled after Kabat-Zinn's MBSR (1982, 1990). Segal et al. conceptualize depressive relapse in the following manner: Someone vulnerable to relapse begins to experience a negative emotion such as sadness. Through associative learning, which took place during earlier episodes, negative emotions are associated with negative thinking. The negative emotion initiates negative thinking, beliefs, and uncomfortable physical sensations. The person deals with the negative thoughts by ruminating in an attempt to solve the problem of their uncomfortable inner state, but it is a problem without a solution. These negative experiences aggravate the already negative mood, and a self-perpetuating cycle of negative thoughts, emotions, and physical sensations has begun.

Through the use of mindfulness techniques, participants learn to be more keenly aware of their present experiences. They are able to identify negative thoughts, feelings, and sensations when they arise, and then adopt a more accepting, nonjudgmental state that interrupts the ruminative response and facilitates a more adaptive, less mood dependent response to low mood or other difficulties, thus interrupting the relapse pattern. Themes of MBCT sessions include stepping out of automatic pilot mode, increasing awareness of bodily sensations, increasing awareness of thoughts and reactions to thoughts, mindfulness of the breath, staying connected to the present moment, acceptance, understanding that thoughts are not facts, self-care, and behavioral activation. The protocol consists of 8 sessions, one per week for 8 weeks. Each session begins with 40 minutes of meditation. Participants are expected to meditate daily, and monitor their practice. Other homework assignments include mindful eating, mindfulness in daily activities, engaging in 3-minute breathing exercises, and monitoring reactions to pleasant and unpleasant events.

Other Aspects of the Mindfulness-Based Interventions Course

After the 8-week MBCT protocol, the Mindfulness Based interventions course continued to begin each week with a 40-minute meditation, although the remaining meditations were optional, and some students chose not to participate in this portion of the course. Students were encouraged to continue their mindfulness practice outside of class as well. Throughout the course, students were required to keep a journal of their experiences with mindfulness training, and to submit their journal entries to the instructor on a weekly basis via email. Other than MBCT, course subject matter included lessons on fundamental principles of Buddhism, ACT, Mindfulness and Acceptance-Based Behavioral Therapies (Roemer & Orsillo, 2009), DBT, and anxiety from a mindfulness perspective.

Hypotheses

I anticipated that in the Mindfulness Group, there would be a statistically significant within-group difference between times 1 and 2, and between times 2 and 3, for each of the dependent variables, with the mean increasing at each data point. Because the mindfulness training ended directly after time 3 and time 4 represented a 3-month follow-up data collection, I hypothesized that there would be a decrease in the mean for each dependent variable from time 3 to time 4. However, I believed that there would still be a statistically significant difference between time 1 and time 4, with higher levels of all dependent variables being reported at time 4. By contrast to the Mindfulness Group, I anticipated no within-group differences between time points for the Control Group. Consequently, I believed that there would be statistically significant between-group differences at times 2, 3, and 4 for each of the dependent variables.

The hypothesis that mindfulness training would increase facets of mindfulness is based upon the theoretical relationship between mindfulness and mindfulness training, as well as

support from the literature (Baer et al., 2008; Chambers, Lo, & Allen, 2008; Shapiro, Brown, & Biegel, 2007). My belief that mindfulness training would increase self-compassion is based upon the theoretical and empirical relationships between mindfulness and self-compassion, as detailed in the Relationships Among Constructs section.

My hypothesis that mindfulness training would increase internal locus of control is less supported by the current literature. With regard to locus of control, Bowen et al. (2006) and Flinton (1997) found that in incarcerated populations, mindfulness training increased internal locus of control with regard to alcohol use and being in a prison environment, respectively. The 2004 study by Tacon, Caldera, and Ronaghan showed an increase in internal health locus of control after MBSR training in a group of women with breast cancer. These studies suggest a relationship between mindfulness training and increased internal locus of control. However, both studies measured locus of control of a specific dimension, whereas the current study targeted general locus of control. My hypothesis is also supported by the positive correlation found between mindfulness and internal locus of control (St. Charles, 2010).

My basis for the hypothesis that mindfulness training would increase general self-efficacy partially stemmed from correlations between self-efficacy and the other constructs targeted in this study. St. Charles (2010) and Greason and Cashwell (2009) found mindfulness to be positively correlated with counseling self-efficacy and general self-efficacy, respectively. My belief that mindfulness training would increase general self-efficacy was also based upon the theoretical (Judge, Locke, & Durham, 1997) and empirical (Judge, Erez, Bono, & Thoresen, 2002) relationship between self-efficacy and locus of control.

As previously stated, I also predicted that the Mindfulness Group would report some decrease in each dependent variable at time 4. I anticipated that the cessation of formal

mindfulness training would result in some decrease in reported levels of the measured constructs, believing that some of the gains made through the training would remain, but that some would fade with time. This hypothesis was somewhat exploratory, as many similar studies did not report follow-up data. One study by Vollestad, Silvertsen, and Nielsen (2011) examining the effects of MBSR on participants (n=76) with anxiety disorders did find that mindfulness (as measured by the sum of the FFMQ scores) increased from pre-treatment to post-treatment, and then decreased at 6-month follow-up to a level still higher than at pre-treatment.

Method

Participants and Procedure

Participants for the study were recruited from a professional psychology department of a university located in the Pacific Northwest. Participants in the intervention group (mindfulness group) were recruited from the Mindfulness-Based Interventions Class. Participants in the control group were recruited from two Group Intervention classes. There were a total of 44 participants, 23 from the mindfulness group, and 21 from the control group. Exclusionary criteria for the mindfulness group included being under the age of 21, not being in the Mindfulness-Based Interventions Class, and withdrawing early from the class. Exclusionary criteria for the control group included being under the age of 21, being in the Mindfulness-Based Interventions Class, and having previously taken the Mindfulness-Based Interventions class. Demographic information was not collected. Participants were entered in a raffle for eight $25.00 gift certificates. Recruitment and data collection began in August 2011. Data was collected at four points: during the first day of class, at the mid-point in the semester, at the end of the semester, and three months after the end of the semester.

Students were recruited during their first classes. Informed consent was explicitly obtained by having participants sign a form. Participants filled out four self-report measures: the FFMQ, SCS, Internal Control Index (ICI; Duttweiler, 1984), and General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995) at each data collection.

Measures

FFMQ.

The FFMQ is a 39-item self-report instrument that measures five facets of mindfulness. Responses are scored on a 5-point Likert scale ranging from "never or rarely true" to "very often or always true." The measure yields five facet scores (Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and non-reactivity towards inner experience). The measure takes roughly seven minutes to complete.

Baer et al. (2008) reported internal consistency for the five facets ranging from .72 to .92. Baer et al. (2006) found that the five facets had varying degrees of positive correlations with openness to experience, emotional intelligence, and self-compassion. There was one exception: the Nonjudging of Inner Experience facet had a slight negative correlation (.07) with openness to experience. They found that four of the facets (all except for Acting with Awareness) were positively correlated with meditation experience. All of the facets except (Observing) had negative correlations with dissociation, absent-mindedness, psychological symptoms, neuroticism, thought suppression, and experiential avoidance.

SCS.

The SCS is a 26-item self-report measure that is scored on a 5-point Likert scale. Questions involve the theme of how the subject acts towards himself or herself in difficult times. Responses range from "almost never" to "almost always." The SCS yields a total self-

compassion score, as well as the following six subscale scores: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. The measure takes approximately three minutes to complete.

Neff (2003) reported an internal consistency of .92 for the SCS. She also reported that the measure was not significantly correlated with social desirability. Regarding relationships between the subscales, Neff's research indicated the following: The positive subscales (self-kindness, common humanity, and mindfulness) were all found to be positively correlated with each other; the three negative subscales (self-judgment, isolation, and over-identification) were found to be positively correlated with each other; and all of the positive subscales were found to be negatively correlated with all of the negative subscales. Neff also found that SCS scores were negatively correlated with depression, $r = -.51$, $p < .01$, and anxiety, $r = -.65$, $p < .01$. Furthermore, she reported that the SCS was positively correlated with life satisfaction, $r = .45$, $p < .01$.

GSE.

The GSE is a unidimensional, 10-item self-report scale scored using a four-point Likert scale. It measures a sense of perceived self-efficacy. The items are all positive statements that relate to how people cope with daily obstacles and how they adapt to stressful life events. Subjects are asked how true the items are for them, with responses ranging from "not at all true" to "exactly true." The responses are totaled to yield a total score. The measure takes approximately two minutes to complete.

Luszczynska, Scholz, and Schwarzer (2005) reported internal consistency reliabilities of .94 and .89 for two groups of participants from Germany, .90 and .87 for two groups of participants from Poland, and .86 for a group of participants from South Korea. Scholz, Dona,

Sud, and Schwarzer (2002) reported GSE internal consistency reliability of .87 for a sample of 1,594 participants from the U.S.A. The same study, which included 19,120 participants from 25 countries, indicated that the GSE measures a unidimensional construct, which is universal across cultures. In a sample of 1,933 participants from Germany, Poland, and South Korea, Scholz et al. (2002) found the GSE to have significant correlations of -.39 with depressive symptoms, .24 with global quality of life, .19 with social functioning quality of life, .32 with emotional functioning quality of life, .22 with cognitive functioning quality of life, .27 with active coping, .22 with information seeking, .33 with planning, and .32 with positive reframing (*p* values of .05 and .01).

ICI.

The ICI is a 28-item self-report scale scored using a five-point Likert scale. Items measure the extent to which a person endorses an internal or external locus of control. Responses range from "rarely, less than 10% of the time" to "usually, more than 90% of the time." The questions are structured so that a person with a highly internal locus of control would answer half of the items at the "usually" end of the scale and half of the items at the "rarely" end of the scale. Thus, half of the items are reverse scored. The item responses are added together to yield one total score. A high score indicates a high internal locus of control. The measure takes approximately three minutes to complete.

Duttweiler (1984) reported internal consistency reliabilities of .84 and .85 for two samples of 684 and 133 participants respectively when constructing the scale. It should be noted that after the analysis, five of the items were reworded for the final version of the measure in order to strengthen locus of control direction or remove ambiguity. In a study of 85 university students, Jacobs (1993) reported an internal consistence reliability of .82. Duttweiler (1984)

found the ICI to have a significant ($p < .0001$) moderate negative correlation of -.385 with the Rotter I-E Scale (Mirels, 1970), a scale that measures external locus of control. An item analysis by Jacobs (1993) supported the unidimensional structure of the ICI.

Analysis

I compared self-report scores of the mindfulness group to that of the control group in order to determine if mindfulness training had an effect on mindfulness, self-compassion, locus of control, and self-efficacy. I intended to do so using two factorial multivariate analyses of variance (MANOVA), one for the mindfulness facets and one for the remaining constructs. Given the steep drop off in participation between the third and final data collections, I elected to conduct two additional MANOVAs using only Time 1 – Time 3 data.

There were two categorical variables: time, with three or four categories, depending upon the analysis (Time 1 – Time 3 and Time 1 – Time 4), and group, with two categories, mindfulness group and control group. There were five quantitative dependent variables in one MANOVA (the five facets of the FFMQ: Observing, Describing, Acting with Awareness, Nonjudging of Inner Experience, and non-reactivity towards inner experience). There were three dependent variables in the other MANOVA: self-compassion, as measured by the SCS; general self-efficacy, as measured by the GSE; and locus of control, as measured by the ICI.

Mahalanobis Distance was calculated in order to identify any outliers. Regarding the assumption of independence, the observations within each sample were independent of each other, but random sampling was not used. Regarding normality, MANOVA is typically robust to violations of this assumption. I assessed for univariate normality of each dependent variable by examining distribution skewness and kurtosis. I tested for the assumption of homogeneity of variance using Levene's Test of Equality of Variances. The linearity assumption was assessed

by examining correlations between dependent variables. I tested for homoscedasticity using Box's test of Equity of Covariance Matrices.

The effects of time were examined, and compared between groups, to determine if mindfulness training (as provided by the Mindfulness-Based Interventions course) had an effect on the dependent variables. I did so by examining the appropriate multivariate statistic (Wilks's Lambda, if Box's Test of Equity has a *p* value greater than .025, or Pillai's Trace, if the Box's Test of Equity has a *p* value less than .025), *F* value, degrees of freedom, *p* value, and effect size. If the multivariate statistic was found to not be significant, that indicated there was no significant difference between the two groups regarding the dependent variables, suggesting that the mindfulness training did not have an effect on the targeted constructs. If the multivariate statistic was found to be significant, then I examined the univariate tests (*F* value, degrees of freedom, *p* value, and effect size) for each dependent variable in order to determine exactly which constructs were significantly different between groups. Pairwise comparisons were examined to determine which data collection points had significant differences between groups.

Results

Missing Data

When the study began, there were 23 participants in the mindfulness group and 21 participants in the control group. When the data was calculated using Time 1 – Time 3, there were 19 participants in the mindfulness group and 18 in the control group for the FFMQ MANOVA. When Time 4 data was included, that number decreased to 14 and 13, respectively. For the Time 1 – Time 3 MANOVA examining the other constructs, there were 18 participants in the mindfulness group and 17 participants in the Control group. In the Time 1 – 4 analysis of

these constructs, participation dropped to 14 participants in the mindfulness group and 11 in the control group.

There were various reasons for the missing data. Some participants were absent from class during a data collection, and were unable to make up the collection. Measures were distributed on double-sided paper handouts, and occasionally all but the last measure was completed, suggesting that the participant failed to realize that there was another assessment on the back of the last page. Finally, as illustrated by the numbers cited above, there was a steep drop off in participation for the fourth data collection. The first three data collections were collected immediately after class, insuring ease of participation. The fourth data collection occurred months after the original classes had ended. Thus, participation in this final collection relied upon an extra effort on the part of the participants.

Outliers

Mahalanobis distance was calculated to determine multivariate outliers. When conducting the Time 1 – Time 3 MANOVAs (24 DVs), the χ^2 critical value (p value of .001) was 51.18. No case exceeded this value. When conducting the Time 1 – Time 4 MANOVAs (32 DVs), the χ^2 critical value (p value of .001) was 62.49. Again, none of the cases exceeded this value. Thus, no multivariate outliers were found.

Independence

The assumption of independence states that the cases represent a random sample from the population and scores from one case are independent from scores on another case. I used convenience sampling for this study, as opposed to random sampling, thus the independence assumption was violated, raising issues of generalizability to the greater population.

Normality

Normality was tested by examining skewness and kurtosis statistics. I considered any distribution to be non-normal if the absolute value of the skewness statistic was greater than twice the value of the standard error of the skewness statistic. Based upon these criteria, the following distributions were negatively skewed for the Time 1 – 4 analyses: Nonjudging of Inner Experience Time 2 and Nonreactivity to Inner Experience times 2 – 4. For the Time 1 – 3 analyses, Nonjudging of Inner Experience Times 1 and 2; Nonreactivity to Inner Experience times 2 and 3; and self-compassion Time 3 were negatively skewed. None of the distributions were positively skewed.

Similarly, I considered any distribution to be non-normal if the absolute value of the kurtosis statistic was greater than twice the value of the standard error of the kurtosis statistic. For the Time 1 – 4 analyses, Nonjudging of Inner Experience time 2, as well as Nonreactivity to Inner Experience Times 2 – 4 were leptokurtic. For the Time 1 – 3 analyses, Nonjudging of Inner Experience Time 2 and Nonreactivity to Inner Experience Time 2 were both leptokurtic. None of the distributions were platykurtic. The use of non-normal distributions in this study is addressed in the Limitations section. Complete skewness and kurtosis statistics are provided in Appendix F.

Linearity

I assessed for linearity by examining bivariate correlations for each data collection. The size of the correlation, not the significance, was considered relevant in assessing linearity. Higher correlations (.5 or higher) suggested that the linearity assumption was satisfied. Out of 40 correlations for the Mindfulness Time 1 – 4 analysis, all but seven of the correlations were less than .5. However, 22 of the correlations were above .4. For the Mindfulness Time 1 – 3

analysis, five correlations were above .5, and 14 were above .4, out of a total of 30 correlations. An examination of the other Time 1 – 4 analysis (self-compassion, locus of control, and general self-efficacy) revealed six correlations above .5 and seven above .4, out of a total of 12 correlations. Out of a total of 9 correlations in the Time 1 – 3 analysis of these same constructs, three correlations were greater than .5, and six were greater than .4. The issue of non-linear relationships is addressed in the Limitations section. The complete correlation statistics are provided in Appendix G.

Homoscedasticity

I tested for homoscedasticity using Box's test of Equity of Covariance Matrices. For both Time 1 – 3 MANOVAs, Box's M had a significance level greater than .025 (.888 for the SCS, ICI, GSE MANOVA; .850 for the FFMQ MANOVA), indicating equity of the dependent variables across groups. Therefore, the Wilks's Lambda statistic was interpreted for these analyses. For the Time 1 – 4 MANOVAs, Box's test could not be computed because there were fewer than two nonsingular cell covariance matrices. Essentially, there were not enough cases to compute the statistic, given the steep drop off in participation between the third and fourth data collections. Therefore, both the Wilks's Lambda and Pillai's trace statistics were examined for the Time 1 – 4 analyses.

FFMQ: Time 1 – Time 3

For the FFMQ Time 1 – Time 3 MANOVA, significant differences were found in the time points based upon group, Wilks's $\Lambda = .66$, $F(10, 132), = 3.06$, $p < .05$. The multivariate η^2 based on Wilks's Λ was weak, .19. More specific analyses showed that there were no significant differences between the mindfulness group and the control group at Time 1, Wilks's $\Lambda = .96$, $F(5, 31), = .26$, $p = .93$, $\eta^2 = .04$. Thus, there were no significant differences in reported levels of

mindfulness before the mindfulness training intervention began. Significant differences were found between the two groups at Time 2 (Wilks's $\Lambda = .62$, $F(5, 31), = 3.77$, $p < .05$, $\eta^2 = .38$) and Time 3 (Wilks's $\Lambda = .61$, $F(5, 31), = 4.04$, $p < .05$, $\eta^2 = .39$).

Analyses of variance (ANOVA) on the dependent variables were conducted as follow-up tests to the MANOVA. The ANOVA for FFMQ factors 1, 4, and 5 were all found to be significant: FFMQ1, $F(2, 39.11), = 5.52$, $p < .05$, $\eta^2 = .16$; FFMQ4, $F(2, 86.21), = 5.85$, $p < .05$, $\eta^2 = .14$; FFMQ5, $F(2, 50.89), = 10.81$, $p < .05$, $\eta^2 = .24$. The ANOVA for FFMQ factors 2 and 3 were found to not be significant: FFMQ2, $F(2, 4.6), = .53$, $p = .589$; FFMQ3, $F(2, 19.91), = 3.05$, $p = .054$.

Pairwise comparisons were used to examine differences between time points for the mindfulness group (Table 1). For the FFMQ facets 1, 3, 4, and 5, an increase in means between Time 1 and Time 2, and between Time 1 and Time 3 were found to be significant. In each case, there was an increase in mean between Time 2 and Time 3, but not enough to reach statistical significance. For facet 2, there was an increase in mean from Time 1 to Time 2, and from Time 2 to Time 3, resulting in a statistically significant difference only between Time 1 and Time 3. No significant changes in mean scores were found for the control group.

Table 1

Means of Mindfulness Facets by Time for Mindfulness Group

Time 1

Mindfulness Facet	M	SD	Dif	CI (95%)
1. Observing	26.05	5.46	-	-
2. Describing	28.32	4.23	-	-
3. Acting with Awareness	24.26	4.59	-	-
4. Nonjudging of Inner Experience	28.37	5.63	-	-
5. Nonreactivity to Inner Experience	18.63	3.65	-	-

Time 2

Mindfulness Facet	M	SD	Dif	CI (95%)
1. Observing	29.32	4.08	3.26	1.25 – 5.28
2. Describing	30.32	3.37	2.00	-.07 – 4.07
3. Acting with Awareness	26.11	3.81	1.84	.23 – 3.46
4. Nonjudging of Inner Experience	32.21	4.29	3.84	1.32 – 6.36
5. Nonreactivity to Inner Experience	22.95	2.63	4.32	2.77 – 5.87

Time 3

Mindfulness Facet	M	SD	Dif	CI (95%)
1. Observing	30.16	3.96	.84	-.59 – 2.28
2. Describing	31.21	4.59	.90	-.61 – 2.40
3. Acting with Awareness	26.16	3.99	.05	-1.64 – 1.75
4. Nonjudging of Inner Experience	33.37	5.06	1.16	-.70 – 3.01
5. Nonreactivity to Inner Experience	23.05	3.42	.11	-1.14 – 1.35

Dif = Difference from previous time

Pairwise comparisons were also used to examine differences between the two groups at each time point for the facets that were found to be significantly different between groups (facets 1, 4, and 5). For each of these three facets, there was no significant difference between group scores at time 1, but there were significant differences at times 2 and 3, with the mindfulness group scoring higher on the measurements in each data collection. These results are shown in Table 2.

Table 2
Mean differences between groups

Time 1

Mindfulness Facet	Mean Dif	95% CI
1. Observing	1.16	-2.36 – 4.69
4. Nonjudging of Inner Experience	.87	-3.65 – 5.39
5. Nonreactivity to Inner Experience	-.42	-3.27 – 2.42

Time 2

Mindfulness Facet	Mean Dif	95% CI
1. Observing	2.98	.24 – 5.72
4. Nonjudging of Inner Experience	5.99	2.58 – 9.39
5. Nonreactivity to Inner Experience	3.89	1.55 – 6.23

Time 3

Mindfulness Facet	Mean Dif	95% CI
1. Observing	5.27	2.03 – 8.51
4. Nonjudging of Inner Experience	6.31	2.24 – 10.39
5. Nonreactivity to Inner Experience	3.33	.56 – 6.10

Mean Dif = Mindfulness group mean minus control group mean
* = significant difference

SCS, ICI, GSE: Time 1 – Time 3

For the Self-compassion (SCS), Internal Locus of Control (ICI), and General Self-efficacy (GSE) Time 1 – Time 3 MANOVA, significant differences were found in the time points based upon group, Wilks's $\Lambda = .701$, $F(6, 128), = 4.15$, $p < .05$. The multivariate η^2 based on Wilks's Λ was weak, .16. More specific analyses showed that there were significant differences between the mindfulness group and the control group at Time 1, Wilks's $\Lambda = .76$, $F(5, 31), = .23.32$ $p < .05$, $\eta^2 = .24$. Thus, there were already significant differences in reported levels of at least one of the measured constructs before the intervention began. Significant differences were also found between the two groups at Time 2 (Wilks's $\Lambda = .71$, $F(5, 31), = 4.29$, $p < .05$, $\eta^2 = .29$) and Time 3 (Wilks's $\Lambda = .70$, $F(5, 31), = 4.43$, $p < .05$, $\eta^2 = .30$).

Analyses of variance (ANOVA) on the dependent variables were conducted as follow-up tests to the MANOVA. The ANOVA for SCS was found to be significant, $F(2, .94), = 11.87$, p

$< .05$, $\eta^2 = .26$. The ANOVA for the ICI ($F(2, 47.21) = 1.47$, $p = .237$) and GSE ($F(2, 5.52) = 1.17$, $p = .317$ were not significant.

Pairwise comparisons were used to examine differences between time points for the mindfulness group means on the SCS. There was a significant increase in means between Time 1 ($M = 2.93$, $SD = .60$) and Time 2 ($M = 3.49$, $SD = .46$), with a 95% confidence interval around the mean difference of -.76 to -.36. The increase from Time 1 to Time 3 ($M = 3.51$, $SD = .40$) was also found to be significant, with a 95% confidence interval around the mean difference of -.81 to -.36. There was an increase in mean between Time 2 and Time 3, but not enough to reach statistical significance. No significant changes in mean scores were found on the SCS for the control group. On the other two measures, no significant changes in mean scores were found for either group.

Pairwise comparisons were used to examine differences between the two groups at each time point for the SCS. At Time 1, there was no significant difference between the mindfulness group ($M = 2.93$, $SD = .60$) and the control group ($M = 3.10$, $SD = .73$), though the control group did report a higher level of self-compassion. At Time 2 there was a shift, with the mindfulness group ($M = 3.49$, $SD = .46$) showing an increase in Self-compassion, and a score higher than that of the control group ($M = 3.12$, $SD = .67$), though not the point of reaching a significant difference. At Time 3, a significant difference was reached. The mindfulness group's SCS score had continued to increase ($M = 3.51$, $SD = .40$), while the control group's score had stayed roughly the same ($M = 3.10$, $SD = .73$). The 95% confidence interval around the Time 3 mean difference was .02 to .82.

FFMQ: Time 1 – Time 4

Differences in time points based upon group were not significant in the FFMQ Time 1 – Time 4 MANOVA. This finding was consistent in both the Wilks's Lambda statistic (Wilks's Λ = .72, $F(15, 196)$, = 1.64, p = .07) and the Pillai's trace statistic (Pillai's trace = .30, $F(15, 219)$, = 1.59, p = .08). Thus, any differences within univariate analyses were determined to be the result of multiple comparisons, and not caused by a response to the mindfulness training intervention. Explanations for the difference in findings between the FFMQ Time 1 – 3 and Time 1 – 4 analyses are provided in the Discussion section.

SCS, ICI, GSE: Time 1 – Time 4

Differences in time points based upon group were significant for the SCS, ICI, GSE Time 1 – 4 analysis. Significant p values were found for both multivariate statistics: Wilks's Λ = .68, $F(9, 163)$, = 3.12, $p < .05$, $\eta^2 = .12$; Pillai's trace = .33, $F(9, 207)$, = 2.89, $p < .05$, $\eta^2 = .11$. More specific analyses showed that there were no significant differences between the mindfulness group and the control group at Time 1, Wilks's Λ = .79, Pillai's trace = .24, $F(3, 21)$, = 2.23, p = .16, $\eta^2 = .04$. The two groups were reporting similar levels of self-compassion, locus of control, and self-efficacy when the study began. There was a significant difference between the two groups at Time 2, Wilks's Λ = .69, Pillai's trace = .31, $F(3, 21)$, = 3.11, $p < .05$, $\eta^2 = .31$. However, there was not a significant difference between groups at Time 3 (Wilks's Λ = .77, Pillai's trace = .23, $F(3, 21)$, = 2.13, p = .13, $\eta^2 = .23$) or at Time 4 (Wilks's Λ = .87, Pillai's trace = .14, $F(3, 21)$, = 1.09, p = .16, $\eta^2 = .14$).

ANOVAs were conducted to determine which DVs were significantly different between groups at Time 2. The ANOVA for SCS was found to be significant: $F(2.31, .65)$, = 6.33, $p <$ .05, $\eta^2 = .22$. The ANOVAs for ICI ($F(3, 4.71)$, = .14, p = .93, $\eta^2 = .01$) and GSE ($F(2.69,$

12.52), = 2.67, p = .06, η^2 = .10) were not significant. Thus, the only significant finding in this analysis was the difference between groups in reported levels of self-compassion at Time 2. The mindfulness group increased its reported level of self-compassion from Time 1 (M = 3.00, SD = .58) to Time 2 (M = 3.51, SD = .45). By contrast, the control group's level of self-compassion stayed relatively stable from Time 1 (M = 3.15, SD = .67) to Time 2 (M = 3.08, SD = .59). The result was a significant mean difference between the two groups at Time 2 of .43, with a 95% confidence interval of .003 to 864. Reasons for the differences in findings between this analysis and the Time 1 – 3 analysis is provided in the Discussion section.

Discussion

This study was designed to examine how mindfulness training affects mindfulness, self-compassion, locus of control, and self-efficacy. I hypothesized that mindfulness training would be associated with increases on measures of these constructs. I also hypothesized that the data would indicate an increase throughout the duration of the study, with a slight decrease, but still net gain in these constructs at the three-month follow-up. My hypotheses were partially confirmed. Given the steep drop-off in participation at the final data collection, most of this discussion will involve the Time 1 – 3 analyses. When the Time 1 – 4 analyses are examined, it will be explicitly stated.

Mindfulness Facets

The data reflected that the Observing, Nonjudging of Inner Experience, and Nonreactivity to Inner Experience facets increased significantly with mindfulness training. After the mindfulness training began, differences began to emerge between the two groups with regard to these facets, with the mindfulness group reporting higher scores than the control group. The difference between the groups on the Observing and Nonjudging of Inner Experience facets

increased at Times 2 and 3. The difference between groups on the Nonreactivity to Inner Experience facet decreased slightly from Time 2 to Time 3.

One of the most basic aspects of mindfulness practice involves observing or noticing one's thoughts and emotions, as opposed to avoiding or identifying with them. This is a particularly important aspect of the MBCT training, as it encourages participants to be aware of depressive thoughts as thoughts, as opposed to identifying with them or accepting them as facts. The findings of this study suggest that this skill is strengthened through mindfulness training.

The Nonjudging and Nonreactivity to Inner Experience facets are also fundamental aspects of mindfulness, and important components to the MBCT protocol. MBCT functions to decrease depressive relapses by interrupting a negative feedback loop before it begins. Typically, negative emotions lead to negative thinking, and the subject ruminates in an attempt to solve the *problem* of the negative thoughts and emotions. However, when depressive emotions and thoughts are experienced mindfully, they are less likely to be seen as problems that need to be fixed. Instead, the subject will be inclined to accept the experience, without judging it as bad or wrong. The subject will also be less likely to feel the need to react to, fix, or otherwise try to change the experience. The findings in this study indicate that these aspects of mindfulness do increase with the intervention of mindfulness training

Two of the mindfulness facets, Describing and Acting with Awareness, were not found to be significantly different between the mindfulness group and control group. The Describing items are all items that inquire about the participant's ability to put their inner experiences into words. Describing is one of the core mindfulness skills in DBT, but it is not an aspect of MBCT, and was not otherwise practiced as part of the mindfulness training provided in this study. Thus, it is not surprising that the difference between groups was not significant for this facet.

The absence of a statistically significant difference between groups with regard to the Acting with Awareness facet is more unexpected. Questions relating to this facet deal with attentiveness, concentration, and awareness in one's daily life. The theme of the first session of MBCT is *Automatic Pilot*, and deals with becoming more aware. It might be that while participants were training to be more aware of their thoughts and emotions while meditating, they were not translating this skill to their daily activities. Another explanation is that when the study began, participants were somewhat unaware of how unmindful they were in their daily life. Through the duration of the mindfulness training, the mindfulness group may have become more aware of how unaware they often were, thus changing their understanding of the items of this facet.

In addition to comparing the mindfulness group to the control group, I also examined each group individually, and examined changes over time. There were no significant changes in any of the mindfulness facets for the control group. For the mindfulness group, the study revealed significant increases over time for all of the mindfulness facets with the exception of the Describing facet. Again, the results reflect the lack of importance placed upon using language to characterize one's inner experiences. The implication is that describing may in fact be unrelated to or even contrary to the experience of mindfulness.

The fact that the FFMQ Time 1 – 4 analysis did not yield significant variance is not surprising. There was a large drop-off in participation at the fourth data collection. Casewise deletion, as opposed to pairwise deletion, is used for MANOVA analyses. For any case in which one data collection was missing, the entire case was omitted from the analysis. Due to the large drop off at Time 4, participation dropped from 35 to 25 participants. This was a large loss of data for an already small sample size.

Self-compassion, Locus of Control, and General Self-Efficacy

In the analyses of the other constructs (self-compassion, locus of control, and self-efficacy), there was a significant difference between groups in reported levels of self-compassion. Significant differences were not found between groups for the other two constructs. At the beginning of the study, the control group was reporting slightly higher self-compassion than the mindfulness group. At Time 2, the mindfulness group had increased its level of self-compassion and was higher than that of the control group. At Time 3, the mindfulness group's self-compassion mean had continued to increase, and had reached the level of significant difference from the relatively stable mean of the control group.

Although the self-compassion mean of the mindfulness group increased throughout the study, no significant changes in time were found for any of the other constructs in either group. Similar to the rationale offered previously for the act with awareness construct, it may be that the mindfulness group, in becoming more mindful, became more aware of a sense of not being in control or of lacking self-efficacy. Furthermore, given increases in areas of self-compassion and nonjudging of internal experience, it may have become easier for the participants to admit to and report shortcomings in self-efficacy and locus of control.

I had hypothesized that the mindfulness training would result in significant increases in all constructs. This hypothesis was based upon various studies finding correlations between mindfulness and these other constructs. It may be that the sample size was not large enough to capture a significant difference in the other constructs. Or, it may be that it takes time for self-efficacy and internal locus of control to develop once mindfulness is increased.

If mindfulness training increases only one of the targeted constructs, it makes sense that the one construct would be self-compassion. Out of the three constructs measured in this

analysis, self-compassion has the strongest theoretical relationship to mindfulness. Part of being compassionate towards oneself involves being mindfully aware of painful thoughts and feelings, but not over-identifying with them. It would be consistent with the rationale of the mindfulness training provided in this study that it assists participants in being aware of their experiences from a more objective perspective without over identifying with them.

Similar to the FFMQ Time 1 – 4 analysis, the Time 1 – 4 analysis for self-compassion, locus of control, and self-efficacy yielded fewer significant results than the Time 1 – 3 analysis. I again attribute this to a large drop out rate at Time 4 and the necessary use of casewise deletion. There was however, one significant finding in this analysis: a significant difference in self-compassion between groups at Time 2, with the mindfulness group reporting higher levels of the construct.

Limitations

There are a number of limitations of the current study. One is the use of self-report measures. Given the private, internal nature of psychological constructs, researchers often have little choice but to rely upon self-report measures. However, such measures are subject to a number of potential problems. Participants may have a difficult time giving honest, objective answers to some of the questions. For example, a person may lack the mindful awareness to realize how uncompassionate he is towards himself. In such a case, the participant might incorrectly endorse items indicating high levels of mindfulness and self-compassion. The question then becomes, "To what extent can a person lacking mindfulness be aware that he is lacking mindfulness?" Some people may lack mindful awareness, but still have the meta-cognitive capacity to realize such a deficit. Others, however, may not. Also, although Neff (2003) reported that her SCS was not confounded by social desirability, this possibility should

still be considered with the SCS and the other measures, particularly with the current sample. Graduate students may feel internal pressure to believe and report that they do in fact have the positive qualities that this study attempted to measure.

Another potential limitation is the issue of response-shift bias. Through the intervention of mindfulness training, participants likely gained a greater understanding and awareness of some of the constructs being measured, particularly the five facets of mindfulness. Thus, their standard of self-evaluation for these constructs may have changed. Response-shift bias refers to the difference between one's standard of measurement at the beginning and at the end of the study.

Howard and Dailey (1979) examined the phenomenon of response shift bias in a study designed to measure the effects of a workshop intended to improve interviewing techniques. The researchers collected pre- and post-tests, as well as "then" tests, which were participant evaluations at the end of the study of their initial levels of the measured constructs. The results indicated the presence of a response-shift. In each case, the shift served to decrease the perceived effectiveness of the intervention; that is, pre-test scores were higher than then scores, resulting in smaller pre/post differences and larger then/post differences. Behavioral observations confirmed that the then scores were more accurate than the pre scores. Response shift bias may have been present in this study, and while a greater understanding of the constructs could have caused a shift in either direction, the results of the Howard and Dailey study suggest the bias would likely result in a more conservative measurement of change.

One other issue regarding the measures is the use of the GSE. All of the GSE items are posed in the positive direction; none are reverse scored. Thus, the possibility of a participant getting an extremely high or low score based on an *all high* or *all low* response set is introduced.

Another limitation of this study is that the independence assumption was violated. Convenience sampling, as opposed to random sampling, was used. All participants were graduate students, and all of them attended one particular university in the Pacific Northwest, and were students in specific classes. Thus the independence assumption was violated, range restriction is an issue, and any generalization of these results to other populations should be done with extreme caution. Also, the sample size of this study was small. Thus, the results may not fully reflect the effects of mindfulness training. A larger sample size may have yielded more statistically significant results.

The normality assumption was also not fully satisfied. Some of the Nonreactivity and Nonjudging of Inner Experience distributions, as well as one of the self-compassion distributions, were negatively skewed and/or leptokurtic. The linearity assumption was also partially violated. Linearity was assessed using bivariate correlations. Many of these correlations were less than .5, indicating nonlinearity. The results of this study should be viewed with these violations in mind.

Conclusion

Through this study, I sought to understand ways in which mindfulness training affects participants, with a focus on particular constructs. I was interested in whether mindfulness training does in fact increase mindfulness in its participants. The results of this study suggest that it does. The mindfulness group reflected increases in all facets other than Describing. Participants who engaged in the training reported increased levels of observing their inner experiences and acting with awareness. They also reported less of a tendency to judge and react to their inner experiences than when they began the study. These are important qualities of mindfulness that are directly related to the mechanism of change in MBCT: interrupting the

cycle of depressive relapse by becoming aware of one's depressive thoughts and feelings, without having to react to them.

The Describing facet of mindfulness is the most questionable of the five. An argument can be made that describing one's experience with words is fundamentally different from sitting with one's experience. The findings of this study suggest that mindfulness training is not related to an ability to describe one's inner experiences.

The results of this study also indicated that self-compassion is increased though mindfulness training, lending further support to the argument that these two constructs are related. Given the strong correlation between self-compassion and positive mental health, it is important to gain an understanding of how practitioners can increase self-compassion in clients. The findings of this study support the hypothesis that self-compassion can be increased through mindfulness training. It also raises questions as to the mechanism of change in MBCT. Segal, Williams, and Teasdale (2002) suggest that their protocol works by helping clients to interrupt a self-perpetuating cycle of depressive thoughts, emotions, and physical sensations. However, it may that an increase in self-compassion facilitated by the mindfulness training provided in MBCT also plays a role in decreasing depressive relapse.

The study did not support past findings that mindfulness is correlated with self-efficacy and an internal locus of control. It may be that the correlation between these constructs and mindfulness are weaker than between mindfulness and self-compassion. It may also be that although an increase in mindfulness quickly facilitates an increase in self-compassion, an increase in self-efficacy and internal locus of control take longer to develop.

There are various opportunities for further study in this area. For example, it would be beneficial to conduct a similar study with participants who are diagnosed with mood and/or

anxiety disorders. Using such a population might yield important qualitative and quantitative differences. Also, similar studies should be conducted with larger sample sizes. Due to the steep drop off in participation at Time 4, an opportunity was lost. It would be beneficial to understand how stable the changes yielded through the mindfulness training are. Furthermore, this study involved one specific intervention of mindfulness training. Similar studies using other types of mindfulness training, such as those found in ACT and DBT could be beneficial in understanding how different types of training may yield different results. And finally, researchers could mitigate possible contamination through response-shift bias by collecting a "then" score during the final data collection.

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Appendix A

Informed Consent Forms

Informed Consent Form for Mindfulness Group

1. Study Title

The effects of mindfulness training on mindfulness, self-compassion, locus of control, self-efficacy, and time perspective
(IRB Project Number 100-11)

2. Study Personnel

Name	Leland St. Charles, M.S.	Shelly Nicol	James Lane, Ph.D
Role	Principal Investigator	Investigator	Faculty Advisor
Institution	Pacific University	Pacific University	Pacific University
Program	Professional Psychology, Psy.D.	Professional Psychology, Psy.D.	Professional Psychology, Psy.D.
Email	stch6132@pacificu.edu	nico4939@pacificu.edu	lanejb@pacificu.edu
Telephone	415-710-6141	808-381-5834	503-352-7323

3. Study Invitation, Purpose, Location, and Dates

You are invited to participate in a research study that examines the effects of mindfulness training on five constructs: mindfulness, self-compassion, locus of control, self-efficacy, and time perspective. Mindfulness involves maintaining one's attention to the present moment in a nonjudgmental manner. Self-compassion involves extending kindness and understanding to oneself during times of pain or adversity. Locus of control refers to the extent to which a person perceives occurrences in one's life to be within his or her own control. Self-efficacy refers to the extent to which a person believes that he or she is capable of accomplishing a given task. Time perspective refers to the ways in which individuals filter their experience into past, present, and future temporal categories. This study will help to clarify if, and to what extent, mindfulness training affects these five constructs. If you participate in the study, you will be entered into a drawing for ten $20 Starbucks or iTunes Gift Cards (the winner may choose which). The study will take place at the Pacific University, Hillsboro campus. This project has been approved by the Pacific University IRB, and will be completed by March 2012.

4. Participant Characteristics and Exclusionary Criteria

You must be between 21 and 65 years old, and be enrolled in Mindfulness-Based Interventions Class. Exclusion criteria includes being under the age of 21, over the age of 65, not being enrolled in the Mindfulness-Based Interventions Class, and withdrawing from the class before the end of the fall semester. If you withdraw from the class, you will be removed from further participation without regard to your consent.

5. Study Materials and Procedures

There will likely be from 40 – 50 participants in this study (half from the Mindfulness-Based Interventions class, and half from other classes). You will be asked to complete a number of brief questionnaires, four times during the study. At the beginning of the fall 2011 semester and at the end of the semester, you will be asked to complete five questionnaires. These data collections will take each participant about 25 minutes. At the midpoint in the fall semester and 3 months after the completion of the semester, you will be asked to complete four questionnaires. These data collections will take each participant about 15 minutes. Other than the time to answer the questionnaires, there will be no cost to you.

6. Risks, Risk Reduction Steps and Clinical Alternatives

a. Unknown Risks:

(Not Applicable)

b. Anticipated Risks and Strategies to Minimize/Avoid:

This study poses minimal risks to you. There will be no physical, economic, or social risks associated with this study. There may be minor emotional risks involved with the study. Some of the self-report questions may cause you to reflect on a real or perceived lack of self-compassion, mindfulness, self-efficacy, internal locus of control, or bias in time perspective. The likelihood of you experiencing emotional discomfort from filling out these self-report measures is low. In order minimize this risk, you may terminate your participation at any point if you begin to experience emotional discomfort.

c. Advantageous Clinical Alternatives:

(Not Applicable)

7. Adverse Event Handling and Reporting Plan

If you experience an adverse emotional effect due to participation in this survey, you may contact the Primary Investigator, who will refer you to an appropriate mental health agency for assistance. Furthermore, the IRB office will be notified by the next normal business day if minor adverse events occur (e.g., minor emotional distress). The IRB will be notified within 24 hours if major adverse events occur (e.g., more severe emotional distress).

8. Direct Benefits and/or Payment to Participants

a. Benefit(s):

There are no direct benefits to the participant.

b. Payment(s) or Reward(s):

You will be entered in a raffle for ten $20 Starbucks or iTunes Gift Cards (the winner may choose which).

9. Promise of Privacy

Data will be kept in a confidential manner. Informed consent and study data will be separately stored in a locked file cabinet in the office of the Faculty Advisor, Dr. James Lane, at the Pacific University Hillsboro Campus. None of the survey questions involve information that would require the investigators to break confidentiality. For example, none of the questions involve issues of suicidality or child abuse. We will designate an identification number for each

participant. This identification number will be the only form of identification that will be on the surveys. A list of participants and their corresponding identification numbers will be kept in a password protected electronic file that will be stored on a USB drive. The USB drive will be stored separately from the data, but will also be stored in a locked file cabinet in the office of the Faculty Advisor at the Pacific University Hillsboro Campus.

10. Medical Care and Compensation In the Event of Accidental Injury

During your participation in this project it is important to understand that you are not a Pacific University clinic patient or client, nor will you be receiving complete as a result of your participation in this study. If you are injured during your participation in this study and it is not due to negligence by Pacific University, the researchers, or any organization associated with the research, you should not expect to receive compensation or medical care from Pacific University, the researchers, or any organization associated with the study.

11. Voluntary Nature of the Study

Your decision whether or not to participate will not affect your current or future relations with Pacific University. If you decide to participate, you are free to not answer any question or withdraw at any time without prejudice or negative consequences. If you choose to withdraw after beginning the study, you will not be entered in the cash prize raffle. The data you provided up to the point of withdrawal may still be used, unless you request otherwise.

12. Contacts and Questions

The researcher will be happy to answer any questions you may have at any time during the course of the study. If you are not satisfied with the answers you receive, please call Pacific University's Institutional Review Board, at (503) 352-1478 to discuss your questions or concerns further. If you become injured in some way and feel it is related to your participation in this study, please contact the investigators and/or the IRB office. All concerns and questions will be kept in confidence.

13. Statement of Consent

Yes	No	
○	○	I am 21 years of age or over.
○	○	All my questions have been answered.
○	○	I have read and understand the description of my participation duties
○	○	I have been offered a copy of this form to keep for my records.
○	○	I agree to participate in this study and understand that I may withdraw at any time without consequence

Participant's Signature Date

Investigator's Signature Date

14. Participant Contact Information

This contact information is required in case any issues arise with the study and participants need to be notified and/or to provide participants with the results of the study if they wish.

Would you like to have a summary of the results after the study is completed? ____Yes ____No

Participant's Name (Please Print) _____

Street Address _____

Telephone _____

Email _____

Informed Consent Form for Control Group

1. Study Title

The effects of mindfulness training on mindfulness, self-compassion, locus of control, self-efficacy, and time perspective
(IRB Project Number 100-11)

2. Study Personnel

Name	Leland St. Charles, M.S.	Shelly Nicol	James Lane, Ph.D
Role	Principal Investigator	Investigator	Faculty Advisor
Institution	Pacific University	Pacific University	Pacific University
Program	Professional Psychology, Psy.D.	Professional Psychology, Psy.D.	Professional Psychology, Psy.D.
Email	stch6132@pacificu.edu	nico4939@pacificu.edu	lanejb@pacificu.edu
Telephone	415-710-6141	808-381-5834	503-352-7323

3. Study Invitation, Purpose, Location, and Dates

You are invited to participate in a research study that examines the effects of mindfulness training on five constructs: mindfulness, self-compassion, locus of control, self-efficacy, and time perspective. Mindfulness involves maintaining one's attention to the present moment in a nonjudgmental manner. Self-compassion involves extending kindness and understanding to oneself during times of pain or adversity. Locus of control refers to the extent to which a person perceives occurrences in one's life to be within his or her own control. Self-efficacy refers to the extent to which a person believes that he or she is capable of accomplishing a given task. Time perspective refers to the ways in which individuals filter their experience into past, present, and future temporal categories. This study will help to clarify if, and to what extent, mindfulness training affects these five constructs. If you participate in the study, you will be entered into a drawing for ten $20 Starbucks or iTunes Gift Cards (the winner may choose which). The study will take place at the Pacific University, Hillsboro campus. This project has been approved by the Pacific University IRB, and will be completed by March 2012.

4. Participant Characteristics and Exclusionary Criteria

You must be between 21 and 65 years old and be enrolled in one of the Intervention III classes that we are recruiting from. Exclusion criteria will include being under the age of 21, over the age of 65, not being enrolled in one of the Intervention III classes that we are recruiting from, currently being enrolled in the Mindfulness-Based Interventions class, having previously taken the Mindfulness-Based Interventions class, and withdrawing from the Intervention III class before the end of the fall semester. If you withdraw from the class, you will be removed from further participation without regard to your consent.

5. Study Materials and Procedures

There will likely be from 40 – 50 participants in this study (half from the Mindfulness-Based Interventions class, and half from other classes). You will be asked to complete a number of brief questionnaires, four times during the study. At the beginning of the fall 2011 semester and at the end of the semester, you will be asked to complete five questionnaires. These data collections will take each participant about 25 minutes. At the midpoint in the fall semester and 3 months after the completion of the semester, you will be asked to complete four questionnaires. These data collections will take each participant about 15 minutes. Other than the time to answer the questionnaires, there will be no cost to you.

6. Risks, Risk Reduction Steps and Clinical Alternatives

a. Unknown Risks:

(Not Applicable)

b. Anticipated Risks and Strategies to Minimize/Avoid:

This study poses minimal risks to you. There will be no physical, economic, or social risks associated with this study. There may be minor emotional risks involved with the study. Some of the self-report questions may cause you to reflect on a real or perceived lack of self-compassion, mindfulness, self-efficacy, internal locus of control, or bias in time perspective. The likelihood of you experiencing emotional discomfort from filling out these self-report measures is low. In order minimize this risk, you may terminate your participation at any point if you begin to experience emotional discomfort.

c. Advantageous Clinical Alternatives:

(Not Applicable)

7. Adverse Event Handling and Reporting Plan

If you experience an adverse emotional effect due to participation in this survey, you may contact the Primary Investigator, who will refer you to an appropriate mental health agency for assistance. Furthermore, the IRB office will be notified by the next normal business day if minor adverse events occur (e.g., minor emotional distress). The IRB will be notified within 24 hours if major adverse events occur (e.g., more severe emotional distress).

8. Direct Benefits and/or Payment to Participants

a. Benefit(s):

There are no direct benefits to the participant.

b. Payment(s) or Reward(s):

You will be entered in a raffle for ten $20 Starbucks or iTunes Gift Cards (the winner may choose which).

9. Promise of Privacy

Data will be kept in a confidential manner. Informed consent and study data will be separately stored in a locked file cabinet in the office of the Faculty Advisor, Dr. James Lane, at the Pacific University Hillsboro Campus. None of the survey questions involve information that would require the investigators to break confidentiality. For example, none of the questions involve

issues of suicidality or child abuse. We will designate an identification number for each participant. This identification number will be the only form of identification that will be on the surveys. A list of participants and their corresponding identification numbers will be kept in a password protected electronic file that will be stored on a USB drive. The USB drive will be stored separately from the data, but will also be stored in a locked file cabinet in the office of the Faculty Advisor at the Pacific University Hillsboro Campus.

10. Medical Care and Compensation In the Event of Accidental Injury

During your participation in this project it is important to understand that you are not a Pacific University clinic patient or client, nor will you be receiving complete as a result of your participation in this study. If you are injured during your participation in this study and it is not due to negligence by Pacific University, the researchers, or any organization associated with the research, you should not expect to receive compensation or medical care from Pacific University, the researchers, or any organization associated with the study.

11. Voluntary Nature of the Study

Your decision whether or not to participate will not affect your current or future relations with Pacific University. If you decide to participate, you are free to not answer any question or withdraw at any time without prejudice or negative consequences. If you choose to withdraw after beginning the study, you will not be entered in the cash prize raffle. The data you provided up to the point of withdrawal may still be used, unless you request otherwise.

12. Contacts and Questions

The researcher will be happy to answer any questions you may have at any time during the course of the study. If you are not satisfied with the answers you receive, please call Pacific University's Institutional Review Board, at (503) 352-1478 to discuss your questions or concerns further. If you become injured in some way and feel it is related to your participation in this study, please contact the investigators and/or the IRB office. All concerns and questions will be kept in confidence.

13. Statement of Consent

Yes	No	
○	○	I am 21 years of age or over.
○	○	All my questions have been answered.
○	○	I have read and understand the description of my participation duties
○	○	I have been offered a copy of this form to keep for my records.
○	○	I agree to participate in this study and understand that I may withdraw at any time without consequence

Participant's Signature Date

Investigator's Signature Date

14. Participant Contact Information

This contact information is required in case any issues arise with the study and participants need to be notified and/or to provide participants with the results of the study if they wish.

Would you like to have a summary of the results after the study is completed? ____Yes ____No

Participant's Name (Please Print) _____

Street Address _____

Telephone _____

Email _____

Appendix B

Five Facet Mindfulness Questionnaire (Baer et al, 2006)

Five Facet Mindfulness Questionnaire Description: This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience.

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
_____ 2. I'm good at finding words to describe my feelings.
_____ 3. I criticize myself for having irrational or inappropriate emotions.
_____ 4. I perceive my feelings and emotions without having to react to them.
_____ 5. When I do things, my mind wanders off and I'm easily distracted.
_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____ 7. I can easily put my beliefs, opinions, and expectations into words.
_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
_____ 9. I watch my feelings without getting lost in them.
_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____ 12. It's hard for me to find the words to describe what I'm thinking.
_____ 13. I am easily distracted.
_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
_____ 16. I have trouble thinking of the right words to express how I feel about things
_____ 17. I make judgments about whether my thoughts are good or bad.
_____ 18. I find it difficult to stay focused on what's happening in the present.
_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
_____ 21. In difficult situations, I can pause without immediately reacting.
_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
_____24. When I have distressing thoughts or images, I feel calm soon after.
_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
_____ 26. I notice the smells and aromas of things.
_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
_____ 28. I rush through activities without being really attentive to them.
_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.

_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
_____ 32. My natural tendency is to put my experiences into words.
_____ 33. When I have distressing thoughts or images, I just notice them and let them go.
_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
_____ 36. I pay attention to how my emotions affect my thoughts and behavior.
_____ 37. I can usually describe how I feel at the moment in considerable detail.
_____ 38. I find myself doing things without paying attention.
_____ 39. I disapprove of myself when I have irrational ideas.

Appendix C

Self-Compassion Scale (Neff, 2003)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself.

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____ 14. When something painful happens I try to take a balanced view of the situation.

_____ 15. I try to see my failings as part of the human condition.

_____ 16. When I see aspects of myself that I don't like, I get down on myself.

_____ 17. When I fail at something important to me I try to keep things in perspective.

_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.

_____ 19. I'm kind to myself when I'm experiencing suffering.

_____ 20. When something upsets me I get carried away with my feelings.

_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.

_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.

_____ 23. I'm tolerant of my own flaws and inadequacies.

_____ 24. When something painful happens I tend to blow the incident out of proportion.

_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Appendix D

General Self-Efficacy Scale (Jerusalem & Schwarzer, 1979)

Read each statement, and indicate how true the statement is for you.

Response Format 1 = Not at all true 2 = Hardly true 3 = Moderately true 4 = Exactly true

1	I can always manage to solve difficult problems if I try hard enough.
2	If someone opposes me, I can find the means and ways to get what I want.
3	It is easy for me to stick to my aims and accomplish my goals.
4	I am confident that I could deal efficiently with unexpected events.
5	Thanks to my resourcefulness, I know how to handle unforeseen situations.
6	I can solve most problems if I invest the necessary effort.
7	I can remain calm when facing difficulties because I can rely on my coping abilities.
8	When I am confronted with a problem, I can usually find several solutions.
9	If I am in trouble, I can usually think of a solution.
10	I can usually handle whatever comes my way.

Appendix E

Internal Control Index (Duttweiler, 1984)

Read each statement. Where there is a blank indicate what your usual attitude, feeling or behavior would be.

A = Rarely (less than 10 % of the time) B= Occasionally (30% of the time) C= Sometimes (50% of the time) D= Frequently (70% of time) E= Usually (+90% of time)

1. When faced with a problem I ____ try to forget it.
2. I ____ need frequent encouragement from others to keep working at a difficult task.
3. I ____ like jobs where I can make decisions and be responsible for my own work.
4. I_____ change my opinion when someone I admire disagrees with me.
5. If I want something I ____ work hard to get it.
6. I _____prefer to learn facts about something from someone else rather than have to dig them out for myself.
7. I will_____ accept jobs that require me to supervise others.
8. I_____ have a hard time saying "no' when someone tries to sell me something.
9. I_____ like to have a say in any decisions made by any group I'm in.
10. I _____consider the different sides of an issue before making a decision.
11. What other people think_____has a great influence on my behaviour.
12. Whenever something good happens to me I _____ feel it is because I earned it.
13. I _____ enjoy being in a position of leadership.
14. I ____need someone else to praise my work before I am satisfied with what I've done.
15. I am _____ sure enough of my opinions to try to influence others.
16. When something is going to affect me I _____ learn as much as I can about it.
17. I_____decide to do things on the spur of the moment.
18. For me, knowing I've done something well is_____ more important than being praised by someone else.
19. I____let other people's demands keep me from doing things I want to do.
20. I_____stick to my opinions when someone disagrees with me.
21. I____ do what I feel like doing, not what other people think I ought to do.
22. I_____get discouraged when doing something that takes a long time to achieve results.
23. When part of a group I ____ prefer to let other people make all the decisions.
24. When I have a problem I_____follow the advice of friends or relatives.
25. I____ enjoy trying to do difficult tasks more than I enjoy doing easy tasks.
26. I _____prefer situations where I can depend on someone else's ability rather than my own.
27. Having someone important tell me I did a good job is_____ more important to me than feeling I've done a good job.
28. When I am involved in something I ____try to find out all I can about what is going on, even when someone else is in charge.

Appendix F

Skewness and Kurtosis Statistics

Table 3
Skewness and Kurtosis, FFMQ Time 1 – 3 Analysis
n = 37

Time	*M*	*SD*	Skewness	Skewness *SE*	Kurtosis	Kurtosis *SE*
Observing						
1	25.4865	5.23674	.517	.388	.817	.759
2	27.8649	4.32154	.121	.388	-.600	.759
3	27.5946	5.47956	-.188	.388	.319	.759
Describing						
1	28.1081	5.72899	-.441	.388	-.372	.759
2	29.5946	5.29391	-.482	.388	.034	.759
3	30.3514	5.26105	-.323	.388	-.699	.759
Acting with Awareness						
1	24.5135	4.75290	-.423	.388	-.002	.759
2	25.3514	4.25060	-.141	.388	.179	.759
3	25.0270	5.30454	-.616	.388	-.603	.759
Nonjudging of Inner Experience						
1	27.9459	6.69140	-.761	.388	.709	.759
2	29.2973	5.87303	-.944	.388	1.560	.759
3	30.2973	6.81447	-.614	.388	-.603	.759
Nonreactivity to Inner Experience						
1	18.8378	4.19996	-.094	.388	-.516	.759
2	21.0541	3.97873	-1.030	.388	2.056	.759
3	21.4324	4.41928	-.788	.388	1.106	.759

Table 4

Skewness and Kurtosis: General Self-Efficacy, Internal Control Index, and Self-compassion Scale, Time 1 – 3 Analysis

n =37

Time	*SD*	Skewness	Skewness Standard Error	Kurtosis	Kurtosis Standard Error
General Self-Efficacy					
1	32.3143	3.26092	-.001	.398	.692
2	32.9714	3.40834	.130	.398	-.574
3	32.3714	3.75802	-.477	.398	1.086
Internal Control Index					
1	102.8857	10.95384	-.293	.398	.136
2	104.6857	11.56509	-.213	.398	-.793
3	104.8000	13.26384	-.280	.398	-.306
Self-compassion					
1	3.0143	.65981	-.176	.398	-.569
2	3.3066	.59133	-.505	.398	-.310
3	3.3088	.61138	-.808	.398	.226

Table 5
Skewness and Kurtosis, FFMQ Time 1 – 4 Analysis
n = 27

Time	*M*	*SD*	Skewness	Skewness *SE*	Kurtosis	Kurtosis *SE*
Observing						
1	25.2222	5.61819	.726	.448	1.107	.872
2	28.4815	4.44946	.101	.448	-.808	.872
3	28.0370	5.59864	-.466	.448	1.105	.872
4	28.2593	5.58565	.340	.448	-.617	.872
Describing						
1	28.7037	5.57339	-.341	.448	-.765	.872
2	30.2593	4.91147	-.497	.448	.465	.872
3	30.8519	5.25287	-.333	.448	-.555	.872
4	30.9630	5.40286	-.613	.448	.434	.872
Acting with Awareness						
1	25.2593	3.98644	-.124	.448	-.437	.872
2	25.2593	3.39221	-.139	.448	-.401	.872
3	26.0000	4.64923	-.781	.448	-.144	.872
4	25.8519	4.03546	-.396	.448	-.558	.872
Nonjudging of Inner Experience						
1	28.5926	6.24043	-.324	.448	-.828	.872
2	29.5185	6.06611	-.933	.448	1.807	.872
3	30.7778	6.41113	-.657	.448	-.200	.872
4	31.1111	6.33266	-.227	.448	-1.401	.872
Nonreactivity to Inner Experience						
1	19.1852	4.05763	-.380	.448	-.100	.872
2	21.1852	4.06710	-1.300	.448	3.197	.872
3	22.1481	4.50388	-1.381	.448	2.977	.872
4	21.5556	4.29072	-1.092	.448	2.656	.872

Table 6

Skewness and Kurtosis: General Self-Efficacy, Internal Control Index, and Self-compassion, Time 1 – 4 Analysis

n = 27

Time	*SD*	Skewness	Skewness Standard Error	Kurtosis	Kurtosis Standard Error
General Self-Efficacy					
1	32.6400	3.47467	-.215	.464	1.025
2	32.8800	2.92005	.096	.464	-.829
3	32.8400	3.27465	.224	.464	-.731
4	33.5600	3.31763	-.635	.464	.559
Internal Control Index					
1	103.0000	11.74024	-.397	.464	.317
2	105.7200	11.09625	-.393	.464	.033
3	105.8800	12.50773	-.272	.464	.523
4	104.0800	14.26511	-.561	.464	.371
Self-compassion					
1	3.0662	.61694	-.150	.464	-.402
2	3.3231	.55091	-.386	.464	-.172
3	3.3862	.56901	-.893	.464	.480
4	3.3338	.59602	-.258	.464	-.022

Appendix G

Correlations

Note: *p* values are not given, as they are not relevant for assessing linearity.

Table 7
Correlations: FFMQ, Time 1 – Time 3
n = 37

Measure	1	2	3	4	5
	Time 1				
1. Observing	-				
2. Describing	.439	-			
3. Acting with Awareness	.362	.398	-		
4. Nonjudging of Inner Experience	.257	.540	.440	-	
5. Nonreactivity to Inner Experience	.311	.303	.329	.429	-
	Time 2				
1. Observing	-				
2. Describing	.397	-			
3. Acting with Awareness	.484	.441	-		
4. Nonjudging of Inner Experience	.297	.249	.370	-	
5. Nonreactivity to Inner Experience	.506	.296	.556	.529	-
	Time 3				
1. Observing	-				
2. Describing	.301	-			
3. Acting with Awareness	.437	.474	-		
4. Nonjudging of Inner Experience	.299	.351	.532	-	
5. Nonreactivity to Inner Experience	.458	.409	.370	.372	-

Table 8

Correlations: General Self-Efficacy, Internal Control Index, and Self-Compassion, Time 1 – Time 3

n = 35

Measure	1	2	3
Time 1			
1. General Self-Efficacy	-		
2. Internal Control Index	.537	-	
3. Self-compassion	.409	.428	-
Time 2			
1. General Self-Efficacy	-		
2. Internal Control Index	.319	-	
3. Self-compassion	.377	.600	-
Time 3			
1. General Self-Efficacy	-		
2. Internal Control Index	.475	-	
3. Self-compassion	.203	.684	-

Table 9
Correlations: FFMQ, Time 1 – Time 4
n = 27

Measure	1	2	3	4	5
Time 1					
1. Observing	-				
2. Describing	.494	-			
3. Acting with Awareness	.458	.457	-		
4. Nonjudging of Inner Experience	.311	.429	.419	-	
5. Nonreactivity to Inner Experience	.256	.309	.197	.427	-
Time 2					
1. Observing	-				
2. Describing	.383	-			
3. Acting with Awareness	.578	.543	-		
4. Nonjudging of Inner Experience	.290	.022	.410	-	
5. Nonreactivity to Inner Experience	.503	.325	.473	.549	-
Time 3					
1. Observing	-				
2. Describing	.280	-			
3. Acting with Awareness	.470	.422	-		
4. Nonjudging of Inner Experience	.158	.155	.488	-	
5. Nonreactivity to Inner Experience	.373	.429	.224	.332	-
Time 4					
1. Observing	-				
2. Describing	.431	-			
3. Acting with Awareness	.561	.631	-		
4. Nonjudging of Inner Experience	.351	.277	.582	-	
5. Nonreactivity to Inner Experience	.387	.510	.549	.385	-

Table 10

Correlations: General Self-efficacy, Internal Control Index, and Self-Compassion, Time 1 – Time 4

n = 25

Measure	1	2	3
Time 1			
1. General Self-Efficacy	-		
2. Internal Control Index	.609	-	
3. Self-compassion	.388	.468	-
Time 2			
1. General Self-Efficacy	-		
2. Internal Control Index	.259	-	
3. Self-compassion	.319	.549	-
Time 3			
1. General Self-Efficacy	-		
2. Internal Control Index	.330	-	
3. Self-compassion	-.062	.622	-
Time 4			
1. General Self-Efficacy	-		
2. Internal Control Index	.621	-	
3. Self-compassion	.636	.829	-